WEST

End of Result Set

Requested Prior Article

Generate Collection | Print

L5: Entry 36 of 36 File: USPT Mar 8, 1994

DOCUMENT-IDENTIFIER: US 5292801 A
TITLE: Doped sol-gel glasses for obtaining chemical interactions

Brief Summary Text (10):
The low-temperature glass synthesis allows doping of inorganic (silica or other) glasses, with essentially any organic molecule. This possibility was used for trapping of photoactive molecules by adding the compound to the starting mixture at the onset of polymerization (Avnir, D., Levy D., Reisfeld, R., J. Phys. Chem. 88, 5956 (1984)). The compound remained permanently trapped, i.e. non-leachable system have been obtained. These doped sol-gel glasses have been used as photoactive materials, such as:

Brief Summary Text (35):
An ideal enzyme catalyst should be bound to a mechanically and chemically stable, highly porous carrier. The bond linking the enzyme to the support is required to be stable under the catalyst application conditions to prevent leaching. The strong binding forces also have stabilizing effects on enzyme activity (Martinek, K. and Mozhaev, V. V. Adv. Enzymol. 57, 179, (1985)). The desired immobilization procedure should be simple, mild (non-denaturing) and generally applicable.

Brief Summary Text (36):
Enzymes covalently immobilized on controlled-pore glass beads offer an almost ideal solution to the problems of the support and of the binding force. However the preparation of catalyst by this immobilization technique is neither simple nor generally applicable. The beads are costly, require tedious chemical derivatization procedures, and lack stability due to the continuous leaching of silica during prolonged usage (Kennedy, J. F. and White, C. A. in "Handbook of Enzyme Biotechnology" (Wiseman, A. ed.), Ellis Horwood Ltd, Chichester, pp. 380-420 (1985)).

Brief Summary Text (40):
The present invention relates therefore also to a method for obtaining bioactive materials based on enzyme molecules trapped within the porous structure of a sol-gel glass. The entrapment is achieved by the addition of a cell-free enzyme to a mixture of monomer or monomers at the onset of polycondensation. In addition to the enzyme and monomer, the mixture should contain additives ensuring (1) highly porous nature of the forming glass providing minimal diffusional limitations to the binding of the substrate at the catalytic site and to the removal of the product, (2) the stability of the enzyme during the polymerization and its tight binding preventing leaching of the enzyme.

Brief Summary Text (41):
Unexpectedly, we have found (1) that proteins can be trapped within the matrix of a forming sol-gel, (2) that several cell-free enzymes, belonging to various classes: hydrolases, oxidoreductases, lyases and the like, can be effectively entrapped in such composite bioactive sol-gel glasses, while retaining high enzymatic activity, and (3) that strong binding forces retain the enzyme in the matrix, thus producing a considerable stabilizing effect.

Other Reference Publication (2):
Song-Ping Liang et al, "Covalent Immobilization of Proteins and Peptides for Solid-Phase Sequencing Using Prepacked Capillary Columns", Analytical Biochemistry

188, (1990), pp. 366-373.